ACT Research & Policy

Technical Brief

June 2017

Do Students Who Opt into ACT's Educational Opportunity Service (EOS) Enroll in College at Higher Rates?

Joann Moore, PhD

Introduction

Students registering to take the ACT can opt into ACT's Educational Opportunity Service (EOS). EOS provides accredited colleges and scholarship agencies with the names and contact information of students who opt in, so they in turn can provide students with marketing and recruitment materials to help students with their college planning. The service is free to students, whereas colleges pay a small fee for each student name selected.

EOS is intended to benefit colleges directly by helping enrollment managers identify students within specific market segments in order to build a diverse and successful student body. EOS is also intended to benefit students who opt into the service indirectly by informing them of college and scholarship opportunities that they may not have previously been aware of or had not considered.

The purpose of this study is to examine whether students do indeed benefit indirectly from opting into EOS. Two main research questions pertaining to the relationship between EOS participation and college attendance are addressed in this study:

1. Do students who opt into EOS enroll in college at a higher rate than students who do not opt into EOS?
2. Are students who opt into EOS more likely to attend a four-year college (rather than a two-year college) than students who do not opt into EOS?

Background

Most U.S. high school students aspire to attend a four-year college (ACT, 2016; Kane & Avery, 2004). However, too many of these students fail to take actions toward attending college, such as taking a national admissions test, completing the Free Application for Federal Student Aid (FAFSA), or completing a college application (Kane & Avery, 2004). Students who aspire to attend college but fail to follow through disproportionately consist of students who lack information about college, including low-income, minority, and students whose parents did not attend college (Dynarski & Scott-Clayton, 2006; Plank & Jordan, 2001).

Acknowledgement: The author thanks Ty Cruce for his input and review of earlier drafts.

Joann Moore is a research scientist in Statistical and Applied Research specializing in prediction of secondary and postsecondary outcomes from academic and non-cognitive factors.

Email research.policy@act.org for more information.

Better access to general information about the costs and benefits of a college education can increase students' chances of pursuing a college education, especially among students who are originally uncertain of their decision to attend (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Oreopoulos & Dunn, 2013). Students find college-specific information and contact with college staff to be highly relevant and moderately to highly useful in forming their college consideration set (Dawes & Brown, 2002). Finding the right college is also important for student success in college, as students are more likely to persist at a school that is a good match for their preferences (ACT, 2014a). Selecting colleges that are a better fit academically and that better align with one's preferences also results in a greater likelihood of timely degree completion (Howell, Pender, & Kumar, 2016).

One goal of EOS is to expose students to information about colleges that may not be in their consideration set, but may be a good fit both academically and with regard to their preferences. This study will examine whether having access to that information from EOS-participating colleges increases students' likelihood of enrolling in college directly after high school, and among those who enroll, whether this access increases their likelihood of attending a four-year college as opposed to a two-year college.

Methods

Sample and Data Sources

The sample for this study was the ACT-tested graduating class of 2014 (N = 1,845,787). Fifty-seven percent of the U.S. graduating class of 2014 took the ACT, including students from all 50 states and Washington, D.C. (ACT, 2014b). Data from the full ACT-tested graduating class was used to address the first research question about college enrollment. The second research question about the type of college attended was based on 69% (N=1,275,485) of the ACT-tested graduating class who enrolled in college directly after high school. Descriptive statistics for the study sample for each research question are provided in Table 1.

The first data source for the study was students' most recent ACT score report, which comprises information on students' test scores, background characteristics, high school preparation and extra-curricular activities, and college plans and preferences. The second data source was students' first-year enrollment records from the National Student Clearinghouse (NSC).[1] The NSC contains data for 98% of all enrollments in Title IV degree-granting institutions in the U.S.

Variables and Outcomes of Interest

The two outcomes of interest in this study are whether a student enrolled in college the fall following high school graduation, and of those students who enrolled in college, whether they enrolled at a four-year college rather than a two-year college. The predictor of interest for this study is students' opt-in status for EOS. Students are classified as *Opt In* (= 1) if they opted into EOS on one or more test occasion (including students who may have opted out on a different test occasion), and they are classified as *No Opt In* (= 0) if they did not opt into EOS on any test occasion.

Prior research (e.g., Hemsley-Brown & Oplatka, 2015; Kane & Avery, 2004; Nguyen & Taylor, 2003; Ordovensky, 1995; Plank & Jordan, 2001) suggests that college enrollment and college type attended are related to factors such as student achievement, demographics, and student aspirations; therefore, a prediction model was estimated to statistically control for these other factors. Student achievement was measured by the students' ACT Composite score. Demographic variables included students' self-reported race/ethnicity, parent income, parent education level (defined as the highest level obtained by either parent), and state of residence (which captures differences in state policies and the availability of postsecondary alternatives that shape college-going and type of college attended). College aspirations and college-seeking behaviors were measured by the total number of colleges to which students sent their scores, self-reported degree aspirations, and students' grade level the first time they took the ACT. Descriptive statistics for outcomes and predictors can be found in Table 1.

Analyses

Two empirical approaches were used to address the research questions. The first approach was to use descriptive analysis to examine the overall differences in college enrollment and enrollment at a four-year college versus a two-year college. To answer the first research question, the percentages of students enrolled in college were compared for students who opted into EOS versus those who did not opt into EOS. Because college enrollment is related to academic achievement, results were broken down by ACT Composite score ranges. To answer the second research question, the percentages of college-enrolled students who enrolled at a four-year college (rather than a two-year college) were compared for students who opted into EOS versus those who did not opt into EOS. These results were also broken down by ACT Composite score ranges.

[1] http://www.studentclearinghouse.org/

The second approach was to estimate a logistic regression model for each research question to statistically control for other factors that prior research has suggested relate to college enrollment and college type attended. For the model predicting whether students enrolled in college the fall following high school graduation, the outcome was a binary variable where enrolled = 1 and not enrolled = 0. For the model predicting four-year college enrollment (enrolled at a four-year college = 1 and enrolled at a two-year college = 0); only students who were enrolled in college the fall following high school graduation were included in the second model. All of the predictors listed above were included in the regression models.

For estimation purposes, all categorical predictor variables were dummy coded, having a reference group that was excluded from the logistic regression model. As such, the regression weights and odds ratios for these variables are interpreted as differences in the chances of enrolling in college or attending a four-year college relative to the reference group. For parent income, the reference group was students whose parents earned more than $100,000 per year. For parent education, the reference group was students for whom at least one parent earned a graduate degree. For degree aspirations, the reference group was students who planned to earn a graduate degree. For race/ethnicity, the reference group was White students. For state of residence, the reference group was Wyoming.

A quadratic term (i.e., ACT Composite squared) was added for ACT Composite scores to determine whether a non-linear relationship exists between ACT Composite scores and college enrollment. Interaction terms (i.e., ACT Composite score multiplied by EOS opt in status and ACT Composite score squared multiplied by EOS opt in status) were also added to determine whether there is an interaction between ACT Composite scores and EOS opt-in status in predicting college enrollment.

Results

Description of Samples

Sixty-nine percent of the ACT-tested 2014 graduating class enrolled in college in the fall of 2014. As seen in Table 1, compared to the overall ACT-tested 2014 high school graduating class, ACT-tested students who enrolled in college had a slightly higher average ACT Composite score, and they were more likely to have higher family income, higher parent education levels, higher degree aspirations, and to self-report their race/ethnicity as White.

In 2014, 86% of the ACT-tested graduating class opted into EOS. As seen in Table 2, students who opted into EOS were more likely than students who did not opt into EOS to enroll in college, have parents with lower income and lower education levels, have higher degree aspirations, self-report their race/ethnicity as African American or Hispanic, and in general be more likely to provide demographic information (i.e., students who opted out of EOS were more likely to withhold information about their degree aspirations, race/ethnicity, and parent income and education).

Table 2 also provides descriptive statistics for the college-enrolled 2014 ACT-tested graduates used to answer the second research question, broken down by whether or not students opted into EOS. Differences between these two groups that were evident for all 2014 ACT-tested graduates were similarly seen for college-enrolled 2014 ACT-tested graduates.

Overall Differences by EOS Opt-In Status

College Enrollment

When examined descriptively, students who opted into EOS were more likely to enroll in college (71%) than those who did not opt into EOS (58%, See Table 2). As Figure 1 illustrates, this trend holds across ACT Composite score ranges, but the largest differences are seen for lower scoring students. For example, among those students in the score range of 1–15, there is a 21 percentage-point difference in the college enrollment rates of students who did and did not opt into EOS.

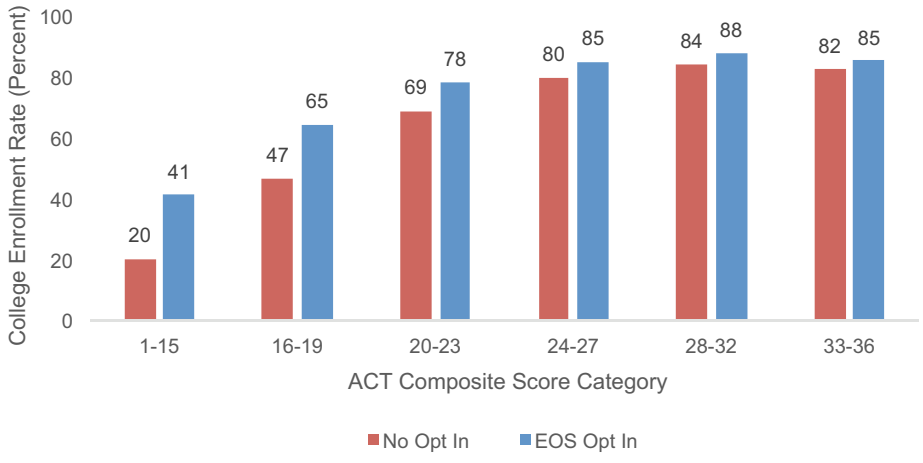

Figure 1. College Enrollment Rates by EOS Opt In and ACT Composite Score Categories.

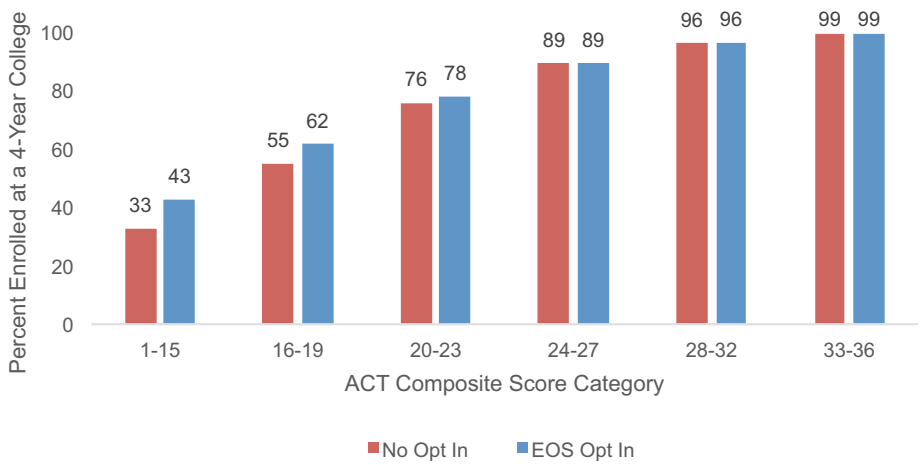

Figure 2. Percent of Enrolled Students at 4-Year Colleges by EOS Opt In and ACT Composite Score Categories.

College Type Attended

Overall, 76% of college enrollees in the ACT-tested graduating class of 2014 enrolled at a four-year college (see Table 1). Those who opted into EOS (76%) were about as likely as those who did not opt into EOS (77%) to attend a four-year college rather than a two-year college (see Table 2). However, as can be seen in Figure 2, students with ACT Composite scores below the 24–27 range who opted into EOS enrolled at four-year colleges at a higher rate than those who did not opt into EOS. For example, there is a 10 percentage-point difference in the four-year college attendance rates for students scoring in the 1–15 range. The differences grow smaller as ACT scores increase, such that nearly all high-scoring college-enrolled students attended four-year colleges rather than two-year colleges, regardless of EOS opt-in status.

Differences by EOS Opt-In Status after Controlling for Student Characteristics

It is tempting to conclude based on the descriptive findings that EOS is causing students to enroll in college at higher rates and to enroll at four-year colleges at higher rates. However, it is possible that other factors are at play, as suggested by prior research. Perhaps students who opt into EOS are more motivated to attend college, and as a result engage in a variety of behaviors that lead to their enrolling at higher rates, including opting into EOS. There is some descriptive evidence suggesting that this is the case. For example, as seen in Table 2, students who opted into EOS were more likely to have higher degree aspirations than those who did not opt into EOS, and these students sent their ACT scores to a greater number of colleges (4.4), on average, than those who did not opt into EOS (4.1).

College Enrollment

To statistically control for some of these motivational differences or other student characteristics, a logistic regression model predicting college enrollment was fit to the graduating class of 2014. This model takes into account EOS opt-in, students' ACT Composite score, the number of colleges to which they sent their scores, family income, parent education level, degree aspirations, race/ethnicity, time of testing (before 12th grade or during 12th grade), and state of residence. Because of the large number of variables in the model, the parameter estimates and odds ratios are presented in Table 3 of the Appendix.

Figure 3 contains the log likelihood of enrollment at each ACT Composite score point and by EOS opt-in status after holding constant the other predictors in the model at their mean values. Even after accounting for all of the other predictors in the model, students who opted into EOS were more likely to enroll in college than those who did not opt in. Both the quadratic and interaction terms were significant, indicating that there is a nonlinear relationship between ACT Composite scores and college enrollment, and that the relationship between EOS opt in and college enrollment is not constant across the ACT Composite score range. As seen in Figure 3, the differences in enrollment rates were greatest for students with lower to moderate ACT Composite scores.

College Type Attended

A second model explored the probability of attending a four-year college (rather than a two-year college), taking into account the same factors as the college enrollment model, but including only those students who enrolled in college the fall following high school graduation. Again, due to the large number of variables in the model, the parameter estimates and odds ratios are included in Table 3 of the Appendix.

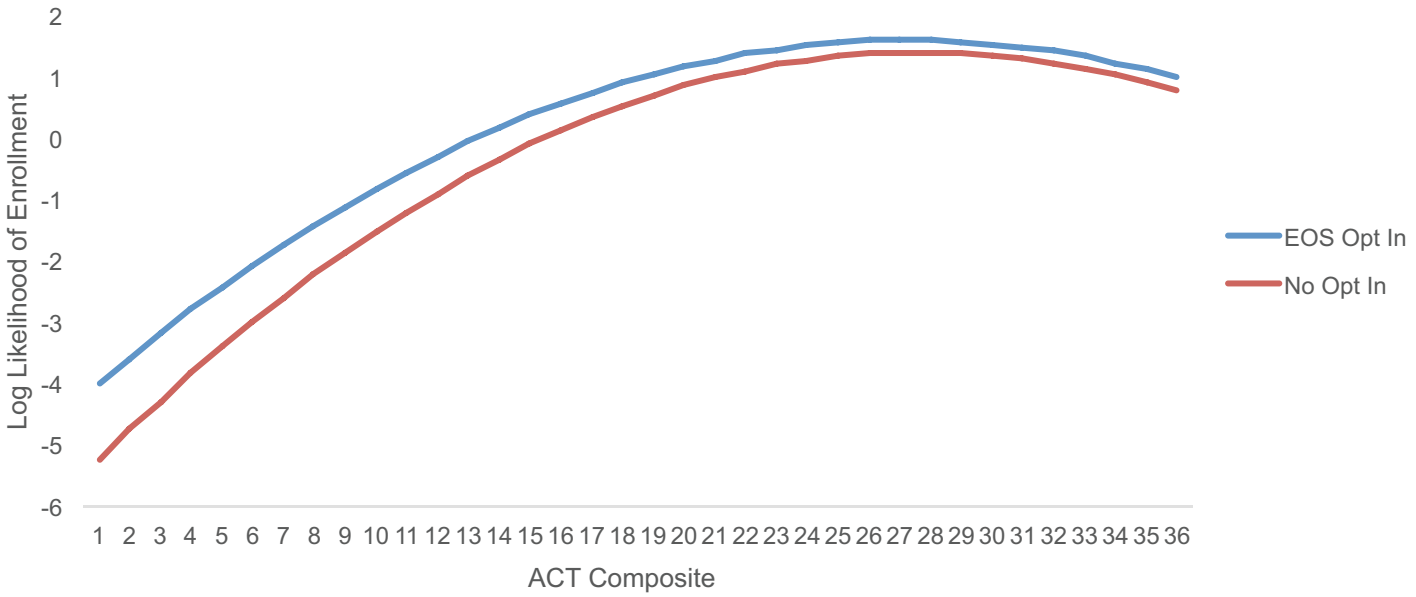

Figure 3. Log Likelihood of College Enrollment by EOS Opt In and ACT Composite Score

In the full model, the quadratic and interaction terms were not significant, and were therefore removed from the final model. In the final model, there was a significant effect of EOS opt-in, with an odds ratio of 1.087, indicating that students who opted into EOS had 8.7% higher odds of enrolling at a four-year college than students who did not opt in.

Discussion

This study found that students who opt into EOS are more likely to enroll in college, and the difference in enrollment rates between students who opted into EOS versus those who did not opt into EOS is greater for students scoring in the low to moderate ACT score range. Of those students who enrolled in college, those who opted into EOS were more likely to attend a four-year college than those with similar achievement who did not opt into EOS. These relationships were found to hold even when controlling for many student characteristics such as student achievement, demographics, and college-seeking behaviors.

Future research should further explore relationships between EOS opt-in and other college outcomes. For example, opting into EOS could help mitigate undermatching, a phenomenon in which high achieving, low-income students tend to enroll at less selective colleges than their higher income peers (Hoxby & Avery, 2013).

One caveat in interpreting the results of this study is that the research design does not allow us to make causal statements about the direct impact of EOS on students' college enrollment decisions; in fact, there are many factors that contribute to a given student's decision to attend college, many of which are not easily controlled statistically nor easily observed and measured. An experimental design in which students were randomly assigned into or out of EOS and followed through college enrollment would make a stronger case for the direct impact of EOS, but it would be difficult to conduct such a study due to the ethical and legal ramifications of sharing students' information (or denying them the opportunity to have their information shared) through EOS without their permission. However, by including a large variety of student characteristics in the prediction model, we can account for at least some of the factors that may influence a student's decision to attend college, such as student achievement, college aspirations, and family income.

While the research presented in this brief does not allow for causal inference, it suggests that students may indeed benefit from opting into EOS even after taking into account information about their background characteristics, prior academic achievement, and state context. EOS was designed to help colleges provide students with an opportunity to learn more about colleges that they may not have considered or been aware of, and therefore the service could potentially expand the range of choices that students are considering. In particular, students in underserved populations who may not have the same levels of knowledge and guidance in planning for college may benefit from having colleges contact them directly in addition to seeking out this information on their own.

References

ACT. (2014a). *College choice report part 3: Persistence and transfer. A profile of 2012 ACT-tested high school graduates*. Iowa City, IA: ACT.

ACT. (2014b). *The condition of college & career readiness 2014: National. Iowa* City, IA: ACT. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/CCCR14-NationalReadinessRpt.pdf.

ACT. (2016). *The condition of college & career readiness 2016: National*. Iowa City, IA: ACT.

Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *The Quarterly Journal of Economics, 127*(3), 1205–1242.

Dawes, P. L., & Brown, J. (2002). Determinants of awareness, consideration, and choice set size in university choice. *Journal of Marketing for Higher Education, 12*(1), 49–75.

Dynarski, S. M., & Scott-Clayton, J. E. (2006). The cost of complexity in federal student aid: Lessons from optimal tax theory and behavioral economics. *National Tax Journal, 59*(2), 319–356.

Hemsley-Brown, J. & Oplatka, I. (2015). University choice: What do we know, what don't we know and what do we still need to find out? *International Journal of Educational Management, 29*(3), 254–274.

Howell, J. S., Pender, M., & Kumar, A. (2016). Academic match and fit: What can we learn from stated preferences, student actions, and collegiate outcomes? In A. P. Kelly, J. S. Howell, & C. Sattin-Bajaj (Eds.), *Matching Students to Opportunity: Expanding College Choice, Access, and Quality*. Cambridge, MA: Harvard Education Press.

Hoxby, C., & Avery, C. (2013). The missing "one-offs": The hidden supply of high-achieving, low-income students. *Brookings Papers on Economic Activity: Spring 2013*. Washington, D.C.: Brookings Institution Press.

Kane, T. J. and Avery, C. (2004). Student perceptions of college opportunities: The Boston COACH Program. In C. Hoxby (Ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It*. Chicago, IL: University of Chicago Press.

Nguyen, A. N., & Taylor, J. (2003). Post-high school choices: New evidence from a multinomial logit model. *Journal of Population Economics*, *16*(2), 287–306.

Ordovensky, F. (1995). Effects of institutional attributes on enrollment choice: Implications for postsecondary vocational education. *Economics of Education Review*, *14*(4), 335–350.

Oreopoulos, P. & Dunn, R. (2013). Information and college access: Evidence from a randomized field experiment, *Scandinavian Journal of Economics, 115*(1), 3–26.

Plank, S. B., & Jordan, W. J. (2001). Effects of information, guidance, and actions on postsecondary destinations: A study of talent loss. *American Educational Research Journal, 38*(4), 947–979.

Appendix

Table 1. Descriptive Statistics for ACT-Tested High School Graduates and College Students

	ACT-tested High School Graduates		ACT-tested College Students	
Variable	**Mean**	**Std Dev**	**Mean**	**Std Dev**
EOS Opt-In	86%		88%	
Enrolled in College	69%			
Attended 4-Year College			76%	
N Schools Sent	4.4	2.7	4.6	2.9
ACT Composite	21.0	5.4	22.2	5.2
Income < $36K	24%		20%	
Income $36–60K	16%		15%	
Income $60–100K	17%		19%	
Income > $100K	17%		20%	
Income Missing	27%		26%	
Parents No College	18%		14%	
Parents Some College	24%		23%	
Parents Bachelor's	23%		26%	
Parents Graduate Degree	18%		21%	
Parent Edu Missing	17%		15%	
Plan Less Than Bachelor's	6%		3%	
Plan Bachelor's	44%		45%	
Plan Graduate Degree	36%		42%	
Plan Missing	13%		10%	
African American	13%		12%	
American Indian	1%		1%	
White	56%		60%	
Asian	4%		5%	
Hispanic	15%		14%	
Pacific Islander	0%		0%	
Multiple Race/ Ethnicity	4%		4%	
Race/ Ethnicity Missing	6%		5%	
Tested 12th Grade	25%		25%	
AK	0%		0%	
AL	2%		2%	
AR	1%		1%	
AZ	2%		2%	
CA	6%		7%	
CO	3%		2%	
CT	1%		1%	
DC	0%		0%	
DE	0%		0%	
FL	7%		7%	
GA	3%		3%	

(*continued*)

Table 1. Descriptive Statistics for ACT-Tested High School Graduates and College Students—*continued*

	ACT-tested High School Graduates		ACT-tested College Students	
Variable	**Mean**	**Std Dev**	**Mean**	**Std Dev**
HI	1%		1%	
IA	1%		1%	
ID	0%		0%	
IL	9%		8%	
IN	1%		2%	
KS	1%		1%	
KY	3%		2%	
LA	3%		2%	
MA	1%		1%	
MD	1%		1%	
ME	0%		0%	
MI	7%		6%	
MN	2%		3%	
MO	3%		3%	
MS	2%		2%	
MT	1%		0%	
NC	5%		4%	
ND	0%		0%	
NE	1%		1%	
NH	0%		0%	
NJ	1%		2%	
NM	1%		1%	
NV	0%		0%	
NY	3%		4%	
OH	5%		5%	
OK	2%		2%	
OR	1%		1%	
PA	1%		2%	
RI	0%		0%	
SC	1%		1%	
SD	0%		0%	
TN	4%		3%	
TX	6%		7%	
UT	2%		1%	
VA	1%		2%	
VT	0%		0%	
WA	1%		1%	
WI	3%		3%	
WV	1%		1%	
WY	0%		0%	
N	1,845,787		1,275,485	

Table 2. Descriptive Statistics by EOS Opt-In Status for ACT-Tested High School Graduates and College Students

	ACT-tested High School Graduates				ACT-tested College Students			
	EOS Opt-In		Not EOS Opt-In		EOS Opt-In		Not EOS Opt-In	
Variable	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
EOS Opt-In	100%		0%		100%		0%	
Enrolled in College	71%		58%		100%		100%	
Attended 4-Year College	76%		77%		76%		77%	
N Schools Sent	4.4	2.7	4.1	3.0	4.6	2.8	4.5	3.2
ACT Composite	21.0	5.3	21.0	6.0	22.1	5.1	23.4	5.4
Income < $36K	25%		15%		21%		10%	
Income $36–60K	16%		11%		16%		10%	
Income $60–100K	18%		13%		20%		15%	
Income > $100K	17%		15%		20%		21%	
Income Missing	24%		47%		23%		45%	
Parents No College	19%		13%		15%		8%	
Parents Some College	25%		16%		24%		15%	
Parents Bachelor's	23%		19%		26%		24%	
Parents Graduate Degree	18%		17%		21%		23%	
Parent Edu Missing	15%		35%		13%		31%	
Plan Less Than Bachelor's	6%		9%		3%		4%	
Plan Bachelor's	46%		34%		46%		40%	
Plan Graduate Degree	38%		26%		43%		35%	
Plan Missing	11%		30%		8%		22%	
African American	14%		7%		13%		5%	
American Indian	1%		1%		1%		0%	
White	56%		61%		59%		68%	
Asian	4%		4%		5%		5%	
Hispanic	16%		10%		14%		8%	
Pacific Islander	0%		0%		0%		0%	
Multiple Race/ Ethnicity	4%		3%		4%		3%	
Race/ Ethnicity Missing	5%		15%		4%		11%	
Tested 12th Grade	25%		21%		25%		24%	
AK	0%		0%		0%		0%	
AL	2%		1%		2%		1%	
AR	2%		1%		1%		1%	
AZ	2%		2%		1%		2%	
CA	6%		5%		7%		8%	
CO	3%		5%		2%		3%	
CT	1%		1%		1%		2%	
DC	0%		0%		0%		0%	
DE	0%		0%		0%		0%	
FL	7%		5%		7%		6%	
GA	3%		2%		3%		3%	
HI	1%		1%		1%		1%	

(*continued*)

Table 2. Descriptive Statistics by EOS Opt-In Status for ACT-Tested High School Graduates and College Students—*continued*

	ACT-tested High School Graduates				ACT-tested College Students			
	EOS Opt-In		Not EOS Opt-In		EOS Opt-In		Not EOS Opt-In	
Variable	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
IA	1%		1%		1%		1%	
ID	0%		0%		0%		0%	
IL	8%		11%		8%		9%	
IN	1%		1%		2%		2%	
KS	1%		1%		1%		1%	
KY	3%		3%		2%		1%	
LA	3%		2%		2%		1%	
MA	1%		2%		1%		2%	
MD	1%		1%		1%		1%	
ME	0%		0%		0%		0%	
MI	6%		8%		6%		5%	
MN	2%		2%		3%		3%	
MO	3%		2%		3%		3%	
MS	2%		1%		2%		1%	
MT	0%		1%		0%		1%	
NC	5%		6%		4%		4%	
ND	0%		1%		0%		0%	
NE	1%		1%		1%		1%	
NH	0%		0%		0%		0%	
NJ	1%		2%		1%		3%	
NM	1%		0%		1%		0%	
NV	0%		0%		0%		0%	
NY	3%		4%		4%		5%	
OH	5%		4%		5%		5%	
OK	2%		1%		2%		1%	
OR	1%		1%		1%		1%	
PA	1%		2%		2%		3%	
RI	0%		0%		0%		0%	
SC	1%		1%		1%		1%	
SD	0%		0%		0%		0%	
TN	4%		4%		3%		2%	
TX	7%		4%		7%		6%	
UT	2%		2%		1%		1%	
VA	1%		2%		1%		2%	
VT	0%		0%		0%		0%	
WA	1%		1%		1%		1%	
WI	3%		2%		3%		3%	
WV	1%		0%		1%		0%	
WY	0%		0%		0%		0%	
N	1,591,776		254,011		1,128,711		146,774	

Table 3. Logistic Regression Results for College Enrollment and Four-year College Attendance Models

	College Enrollment Model[a]			Four-year College Attendance Model[b]		
Variable	Parameter Estimate	Standard Error	Odds Ratio	Parameter Estimate	Standard Error	Odds Ratio
Intercept	-6.355	0.072		-4.633	0.047	
EOS Opt In	1.305	0.071	3.686	0.083	0.008	1.087
N Schools Sent	0.100	0.001	1.105	0.127	0.001	1.136
ACT Composite	0.516	0.006	1.676	0.208	0.001	1.231
ACT Composite Squared	-0.009	0.000	0.991			
ACT EOS Interaction	-0.073	0.007	0.930			
ACT^2 EOS Interaction	0.001	0.000	1.001			
Income < $36K	-0.426	0.007	0.653	-0.302	0.009	0.740
Income $36–60K	-0.273	0.007	0.761	-0.361	0.009	0.697
Income $60–100K	-0.110	0.007	0.896	-0.313	0.009	0.731
Income Missing	-0.244	0.007	0.783	-0.120	0.010	0.887
Parents No College	-0.388	0.007	0.679	-0.444	0.010	0.641
Parents Some College	-0.131	0.007	0.877	-0.434	0.009	0.648
Parents Bachelor's	0.075	0.007	1.078	-0.157	0.009	0.855
Parent Edu Missing	-0.086	0.009	0.918	-0.246	0.012	0.782
Plan Less Than Bachelor's	-0.918	0.008	0.399	-1.341	0.014	0.262
Plan Bachelor's	-0.095	0.004	0.909	-0.326	0.006	0.722
Plan Missing	-0.663	0.007	0.515	-0.532	0.011	0.587
African American	0.150	0.006	1.161	0.790	0.008	2.202
American Indian	-0.298	0.020	0.743	0.292	0.030	1.340
Asian	0.172	0.010	1.188	0.360	0.014	1.433
Hispanic	-0.048	0.006	0.953	0.243	0.008	1.276
Pacific Islander	-0.171	0.032	0.843	0.183	0.046	1.201
Multiple Race/ Ethnicity	-0.165	0.009	0.848	0.157	0.013	1.170
Race/ Ethnicity Missing	-0.252	0.008	0.777	0.096	0.012	1.100
Tested 12th Grade	-0.150	0.005	0.861	-0.302	0.006	0.739
AK	0.863	0.055	2.370	4.036	0.123	56.605
AL	0.868	0.031	2.381	0.969	0.045	2.634
AR	0.722	0.032	2.058	1.462	0.046	4.315
AZ	0.448	0.031	1.564	1.287	0.046	3.621
CA	1.505	0.030	4.505	1.924	0.044	6.851
CO	0.089	0.030	1.093	1.485	0.045	4.416
CT	1.647	0.041	5.193	3.492	0.065	32.857
DC	1.405	0.074	4.074	3.548	0.137	34.736
DE	1.587	0.082	4.887	3.504	0.135	33.235
FL	0.835	0.029	2.305	3.563	0.045	35.269
GA	1.245	0.031	3.474	2.661	0.046	14.313
HI	0.684	0.036	1.982	1.407	0.052	4.085
IA	1.238	0.034	3.449	1.277	0.046	3.587
ID	0.279	0.038	1.322	2.159	0.059	8.659
IL	0.549	0.029	1.731	0.608	0.043	1.836

(*continued*)

Table 3. Logistic Regression Results for College Enrollment and Four-year College Attendance Models—*continued*

	College Enrollment Model[a]			Four-year College Attendance Model[b]		
Variable	Parameter Estimate	Standard Error	Odds Ratio	Parameter Estimate	Standard Error	Odds Ratio
IN	1.169	0.033	3.217	2.940	0.049	18.923
KS	0.946	0.033	2.575	1.121	0.046	3.069
KY	0.315	0.030	1.370	1.230	0.045	3.420
LA	0.432	0.030	1.540	1.353	0.045	3.871
MA	1.676	0.038	5.342	3.744	0.062	42.253
MD	1.505	0.038	4.504	1.900	0.051	6.684
ME	1.185	0.081	3.271	4.005	0.182	54.844
MI	0.362	0.029	1.436	0.946	0.043	2.575
MN	0.725	0.031	2.065	1.625	0.045	5.077
MO	0.925	0.031	2.523	1.144	0.044	3.140
MS	1.333	0.032	3.794	0.017	0.046	1.017
MT	-0.072	0.036	0.931	2.317	0.061	10.140
NC	0.475	0.030	1.608	1.080	0.044	2.946
ND	0.349	0.039	1.417	2.122	0.061	8.346
NE	1.059	0.035	2.884	1.561	0.048	4.763
NH	1.269	0.059	3.558	3.362	0.102	28.840
NJ	0.921	0.033	2.511	2.703	0.050	14.922
NM	1.134	0.036	3.108	1.694	0.050	5.441
NV	0.997	0.040	2.709	3.106	0.063	22.337
NY	1.699	0.032	5.471	2.543	0.045	12.715
OH	0.918	0.030	2.504	2.330	0.044	10.277
OK	0.823	0.032	2.277	1.338	0.046	3.811
OR	0.565	0.035	1.759	1.415	0.051	4.116
PA	1.616	0.034	5.035	3.285	0.051	26.717
RI	1.375	0.073	3.956	3.046	0.111	21.028
SC	1.408	0.034	4.088	1.599	0.046	4.950
SD	0.983	0.042	2.672	2.573	0.061	13.106
TN	0.350	0.030	1.419	1.134	0.044	3.108
TX	1.159	0.030	3.188	1.801	0.044	6.054
UT	-0.629	0.031	0.533	2.367	0.050	10.661
VA	1.607	0.035	4.989	2.317	0.048	10.147
VT	0.966	0.063	2.627	3.262	0.113	26.100
WA	0.844	0.035	2.326	2.504	0.054	12.226
WI	0.955	0.031	2.600	1.848	0.045	6.345
WV	1.004	0.037	2.730	2.986	0.056	19.803

a. All parameter estimates significant at $p < 0.0001$ except CO ($p < 0.01$) and MT ($p < 0.05$); -2 Log likelihood = 2282419.2 (Likelihood Ratio = 418152.9, df = 75, $p < 0.0001$)

b. All parameter estimates significant at $p < 0.0001$ except MS (ns); -2 Log likelihood = 1398769.6 (Likelihood ratio = 366368.1, df = 72, $p < 0.0001$)